AMENDMENTS TO THE CLAIMS

5   This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for simulating <u>a time-domain response of</u> a

10   mixed-signal system comprising acts of:

        generating a ~~matrix-based wavelet~~ <u>wavelet-based matrix</u> operator representation of <u>time-domain</u> equations characterizing a <u>mixed signal</u> system, with the ~~matrix-based wavelet~~ <u>wavelet-based matrix</u> operator representation including wavelet connection

15   coefficients;

        selecting a number of wavelets, ~~and~~ a set of wavelet basis functions, <u>and the wavelet-based matrix operator</u> with which to represent a <u>time domain</u> performance of the system; ~~, whereby the wavelet operator, the number of wavelets and the set of wavelet basis functions represent a~~

20   ~~wavelet model of the system; and~~

        iteratively applying the ~~wavelet model~~ <u>wavelet-based matrix operator within each clock period and sequentially</u> over a ~~series~~ <u>large number</u> of clock cycles to <u>calculate a time-domain response</u> ~~develop a behavioral model~~ of the <u>mixed signal</u> system<u>, wherein calculation</u>

25   <u>within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication; and</u>

        <u>outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain</u>

30   <u>response of the mixed signal system to evaluate the behavioral performance of the system.</u>

2.   (Original) A method for simulating a mixed-signal system as set forth in Claim 1, where the system is an electrical circuit.

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3.   (Original) A method for simulating a mixed-signal system as set forth in Claim 2, where the electrical circuit is a delta-sigma modulator.

4.   (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 3, wherein in the generating act, the ~~matrix-based wavelet~~ wavelet-based matrix operator is developed by a wavelet-

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Galerkin method.

5.   (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 4, wherein in the generating act, the ~~matrix-based wavelet~~ wavelet-based matrix operator is developed directly from a system

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diagram or from equations that describe the system.

6.   (Original) A method for simulating a mixed-signal system as set forth in Claim 5, wherein in the selecting act the number of wavelets is selected

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independently for each iteration of the acts of the method.

7. (Original) A method for simulating a mixed-signal system as set forth in Claim 6, wherein in the selecting act, the set of wavelet basis functions is selected independently for each iteration of the acts of the method.

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8.   (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 7, further comprising acts of receiving a specification for a system model and outputting the time-domain response ~~behavioral~~

~~model~~ of the system.

9.   (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the ~~matrix-based wavelet~~ wavelet-based matrix operator is developed by a wavelet-Galerkin method.

10. (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the ~~matrix-based wavelet~~ wavelet-based matrix operator is developed directly from a system diagram.

11. (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the generating act, the ~~matrix-based wavelet~~ wavelet-based matrix operator is developed directly from equations that describe the system.

12. (Original) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the selecting act the number of wavelets is selected independently for each iteration of the acts of the method.

13. (Original) A method for simulating a mixed-signal system as set forth in Claim 1, wherein in the selecting act, the set of wavelet basis functions is selected independently for each iteration of the acts of the method.

14. (Currently Amended) A method for simulating a mixed-signal system as set forth in Claim 1, further comprising acts of receiving a specification

for a system model and outputting the time-domain response behavioral model of the system.

15.   (Currently Amended) An apparatus for simulating a time-domain response of a mixed-signal system comprising a data processing system, the data processing system having a processor and a memory coupled with the processor, the data processing further including means for:

generating a matrix-based wavelet wavelet-based matrix operator representation of time-domain equations characterizing a mixed signal system, with the matrix-based wavelet wavelet-based matrix operator representation including wavelet connection coefficients;

selecting a number of wavelets, and a set of wavelet basis functions, and the wavelet-based matrix operator with which to represent a time domain performance of the system; , whereby the wavelet operator, the number of wavelets and the set of wavelet basis functions represent a wavelet model of the system; and

iteratively applying the wavelet model wavelet-based matrix operator within each clock period and sequentially over a series large number of clock cycles to calculate a time-domain response develop a behavioral model of the mixed signal system, wherein calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication; and

outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain response of the mixed signal system to evaluate the behavioral performance of the system.

16.   (Original) An apparatus for simulating a mixed-signal system as set forth

in Claim 15, where the system is an electrical circuit.

17. (Original) An apparatus for simulating a mixed-signal system as set forth in Claim 16, where the electrical circuit is a delta-sigma modulator.

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18. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim 17, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator by a wavelet-Galerkin method.

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19. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim 18, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator directly from a system diagram or from equations that describe the system.

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20. (Original) An apparatus for simulating a mixed-signal system as set forth in Claim 19, wherein the means for selecting independently selects the number of wavelets for each iteration.

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21. (Original) An apparatus for simulating a mixed-signal system as set forth in Claim 20, wherein the means for selecting independently selects the set of wavelet basis functions for each iteration.

22. (Currently Amended) An apparatus for simulating a mixed-signal system

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as set forth in Claim 21, further comprising means for receiving a specification for a system model and outputting the time-domain response ~~behavioral model~~ of the system.

23. (Currently Amended) An apparatus for simulating a mixed-signal system

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as set forth in Claim ~~1~~ 15, wherein the means for generating develops the

~~matrix-based wavelet~~ <u>wavelet-based matrix</u> operator by a wavelet-Galerkin method.

24. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim ~~1~~ 15, wherein the means for generating develops the ~~matrix-based wavelet~~ <u>wavelet-based matrix</u> operator directly from a system diagram.

25. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim ~~1~~ 15, wherein the means for generating develops the ~~matrix-based wavelet~~ <u>wavelet-based matrix</u> operator directly from equations that describe the system.

26. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim ~~1~~ 15, wherein the means for selecting independently selects the number of wavelets for each iteration.

27. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim ~~1~~ 15, wherein the means for selecting independently selects the set of wavelet basis functions for each iteration.

28. (Currently Amended) An apparatus for simulating a mixed-signal system as set forth in Claim ~~1~~ 15, further comprising means for receiving a specification for a system model and outputting the <u>time-domain response</u> ~~behavioral model~~ of the system.

29. (Currently Amended) A computer program product for simulating <u>a</u> <u>time-domain response of</u> a mixed-signal system, <u>the computer program</u>

product embodied on ~~comprising~~ a computer readable medium and comprising code that, when executed, causes a computer to perform the acts of ~~having means, encoded thereon for~~:

generating a ~~matrix-based wavelet~~ wavelet-based matrix operator representation of time-domain equations characterizing a mixed signal system, with the ~~matrix-based wavelet~~ wavelet-based matrix operator representation including wavelet connection coefficients;

selecting a number of wavelets, ~~and~~ a set of wavelet basis functions, and the wavelet-based matrix operator with which to represent a time domain performance of the system; ~~, whereby the wavelet operator, the number of wavelets and the set of wavelet basis functions represent a wavelet model of the system; and~~

iteratively applying the ~~wavelet model~~ wavelet-based matrix operator within each clock period and sequentially over a ~~series~~ large number of clock cycles to calculate a time-domain response ~~develop a behavioral model~~ of the mixed signal system, wherein calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication; and

outputting the time-domain response of the mixed signal system to an user, whereby the user can utilize the time-domain response of the mixed signal system to evaluate the behavioral performance of the system.

30. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 29, where the system is an electrical circuit.

31. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 30, where the electrical circuit is a delta-sigma modulator.

32. (Currently Amended) A computer program product for simulating a mixed-signal system as set forth in Claim 31, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator by a wavelet-Galerkin method.

33. (Currently Amended) A computer program product for simulating a mixed-signal system as set forth in Claim 32, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator directly from a system diagram or from equations that describe the system.

34. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 33, wherein the means for selecting independently selects the number of wavelets for each iteration.

35. (Original) A computer program product for simulating a mixed-signal system as set forth in Claim 34, wherein the means for selecting independently selects the set of wavelet basis functions for each iteration.

36. (Currently Amended) A computer program product for simulating a mixed-signal system as set forth in Claim 35, further comprising means for receiving a specification for a system model and outputting the time-domain response ~~behavioral model~~ of the system.

37. (Currently Amended) A computer program product for simulating a

mixed-signal system as set forth in Claim 29, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator by a wavelet-Galerkin method.

5   38. (Currently Amended)   A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator directly from a system diagram.

10   39. (Currently Amended)   A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the means for generating develops the ~~matrix-based wavelet~~ wavelet-based matrix operator directly from equations that describe the system.

15   40. (Original)   A computer program product for simulating a mixed-signal system as set forth in Claim 29, wherein the means for selecting independently selects the number of wavelets for each iteration.

41. (Original)   A computer program product for simulating a mixed-signal
20   system as set forth in Claim 29, wherein the means for selecting independently selects the set of wavelet basis functions for each iteration.

42. (Currently Amended)   A computer program product for simulating a
25   mixed-signal system as set forth in Claim 29, further comprising means for receiving a specification for a system model and outputting the time-domain response ~~behavioral model~~ of the system.